

AMENDMENTS TO THE CLAIMS

The listing of the claims will replace the previous version, and the listing of claims:

LISTING OF CLAIMS

1. (currently amended) A brake apparatus having a service braking system and a regenerating braking system, at least one of the service braking system and the regenerating braking system applying a braking force to wheels upon providing a braking operation, said brake apparatus comprising:

a master cylinder for operating the service braking system having an input shaft which travels according to travel of a brake operational member by the braking operation, a master cylinder pressure chamber, and a master cylinder piston which develops a master cylinder pressure in said master cylinder pressure chamber according to a travel of said input shaft,

a braking force control device having a pump and controlling, in a service braking operation, a discharge pressure of said pump according to the operational conditions of the service braking system and the regenerating braking system,

a controller for operating the pump according to the master cylinder pressure, said pump, upon operation by the controller, sucking brake fluid from the master cylinder pressure chamber and discharging the brake fluid at the discharge pressure controlled by the braking force control device,

a wheel cylinder for receiving the brake fluid at the discharge pressure controlled by the braking force control device and generating the braking force, and

a travel modulating device having a travel modulating piston to which the discharge pressure at the wheel cylinder is applied, and a modulating spring for urging the travel modulating piston, said travel modulating piston, in providing same braking force,

modulating the travel of the brake operational member in the service braking operation to ~~become~~ provide substantially same travel amounts in a braking actuation when the regenerating braking system applies the braking force together with the service braking system and in a braking actuation when the service braking system without the regenerating braking system ~~does not apply~~ only applies the braking force.

2. (original) A brake apparatus as claimed in claim 1, wherein said travel modulating device controls the travel of said master cylinder piston by using the discharge pressure of the pump controlled by said braking force control device.

3. (cancelled)

4. (previously presented) A brake apparatus as claimed in claim 1, wherein said travel modulating device is provided in said master cylinder coaxially with said master cylinder piston.

5. (previously presented) A braking apparatus as claimed in claim 1, wherein said master cylinder piston comprises a first piston which travels when receives an input, and a second piston which is fluid-tightly and slidably disposed relative to said first piston, said second piston being said travel modulating piston and being moved relative to said first piston by applying said wheel cylinder pressure to said second piston, thereby controlling a travel of said first piston.

6. (previously presented) A brake apparatus as claimed in claim 5, wherein said second piston is formed in a cylindrical shape having an outer peripheral step, and is fluid-tightly and slidably fitted in an axial bore of a housing of the master cylinder or in a bore

of a cylindrical member fixed to said housing, and said first piston is fluid-tightly and slidably fitted in said second piston, said brake apparatus further comprising a control pressure chamber into which said wheel cylinder pressure is introduced and which is formed between an outer periphery of said second piston and an inner periphery of the axial bore of said housing or an inner periphery of a bore of said cylindrical member and is defined by the outer peripheral step of said second piston, wherein said wheel cylinder pressure introduced into said control pressure chamber acts on said outer peripheral step of said second piston, thereby controlling the travel of said first piston.

7. (previously presented) A brake apparatus as claimed in claim 5, wherein said second piston is formed in a cylindrical shape having an inner peripheral step, and said first piston is fluid-tightly and slidably fitted in an axial bore of said second piston, said brake apparatus further comprising a control pressure chamber into which said wheel cylinder pressure is introduced and which is formed between an inner periphery of said second piston and an outer periphery of said first piston and is defined by the inner peripheral step of said second piston, wherein said wheel cylinder pressure introduced into said control pressure chamber acts on said inner peripheral step of said second piston, thereby controlling the travel of said first piston.

8. (previously presented) A brake apparatus as claimed in claim 4, wherein said input shaft, which is moved by an input according to the travel of the operational member, is movable relative to said master cylinder piston, said brake apparatus further comprising a control spring which is disposed in a compressed state between said input shaft and said master cylinder piston for controlling a travel of said input shaft, wherein said input of said input shaft

and a spring force of said control spring act in a same direction, said input shaft is said travel modulating piston, said wheel cylinder pressure acts on said input shaft against said input and the spring force of said control spring, and said wheel cylinder pressure is controlled such that forces produced by said wheel cylinder pressure, said input, and the spring force of said control spring are balanced.

9. (previously presented) A brake apparatus as claimed in claim 1, wherein said travel modulating device is located out of a central axis of said master cylinder piston.

10. (previously presented) A brake apparatus as claimed in claim 9, wherein said travel modulating piston controls a travel of said master cylinder piston, said travel modulating piston is moved by applying said master cylinder pressure to said travel modulating piston in one direction and applying a wheel cylinder pressure to said travel modulating piston in a direction opposite to said one direction, thereby controlling the travel of said master cylinder piston.

11. (original) A brake apparatus as claimed in claim 10, wherein said travel modulating piston is composed of a large-diameter piston portion at its one side portion and a small-diameter piston portion at it's the other side portion, said master cylinder pressure acts on said large-diameter piston portion and said wheel cylinder pressure acts on said small-diameter piston portion.

12. (original) A brake apparatus as claimed in claim 10, wherein said travel modulating piston is composed of a large-diameter piston portion at its one side portion and a small-diameter piston portion at it's the other side portion, said master cylinder

pressure acts on said large-diameter piston portion and said wheel cylinder pressure acts on a step between said large-diameter piston portion and said small-diameter piston portion.

13. (previously presented) A brake apparatus as claimed in claim 10, further comprising biasing means for biasing said travel modulating piston in a direction opposite to an action of said master cylinder pressure, wherein said wheel cylinder pressure is controlled such that a force produced by said master cylinder pressure, a force produced by said wheel cylinder pressure, and a biasing force of said biasing means are balanced.

14. (previously presented) A brake apparatus as claimed claim 11, wherein said large-diameter piston portion is sealed by a metal seal and said small-diameter piston portion is sealed by at least either a metal seal or an elastic seal.

15. (previously presented) A brake apparatus as claimed in claim 1, wherein in an event of failure of said pump, said master cylinder pressure is supplied to the wheel cylinder.

16. (previously presented) A brake apparatus as claimed claim 1, wherein an input is applied to said master cylinder piston after intensified by a brake pressure intensifying device at a preset servo ratio by using pressure of a pressure source.

17. (previously presented) A brake apparatus as claimed in claim 16, wherein in an event of failure of said pressure source, a force applied to said operational member is transmitted through said brake pressure intensifying device without magnification.

18. (original) A brake apparatus as claimed in claim 1, wherein said travel modulating device controls the travel of said input shaft according to the discharge pressure of the pump controlled by said braking force control device.

19. (previously presented) A brake apparatus as claimed in claim 18, wherein said travel modulating device has a travel control spring disposed between said master cylinder piston and said input shaft, and said travel modulating device shortens the travel of said input shaft such that the discharge pressure of the pump controlled by a pressure control valve, a spring force of said travel control spring, and said input are balanced.

20. (previously presented) A brake apparatus as claimed in claim 18, wherein said braking force control device controls the discharge pressure of said pump to become greater when said regenerating braking system is not conducted, and to become smaller when said regenerating braking system is conducted.

21. (previously presented) A brake apparatus as claimed in claim 18, wherein said master cylinder piston is operated with the discharge pressure of said pump controlled by said braking force control device, and wheel brakes are actuated with master cylinder pressure developed by this operation of said master cylinder piston.

22-23. (cancelled)